

The following text explains the “Environmental Health Indicators” chart to the right. General topics are in **bold**, and specific categories are in ***bold italic***.

**Water Quality**

***Greene County private well testing*** includes residential wells tested for bacteria by the Springfield-Greene County Health Department. Wells that have high levels of bacteria are deemed unsafe for human consumption. Samples are collected and tested at the request of the well owner.

***E. coli***, dissolved oxygen, and nitrates are commonly used indicators of stream water quality. The Watershed Committee of the Ozarks and the Springfield-Greene County Health Department collect, test and report river and stream E. coli levels at public swimming areas in Greene County during peak recreational water-use months. These three parameters are important water quality indicators that provide a measure of water quality. An adequate level of dissolved oxygen is necessary to support aquatic life. Nitrates are important because as nitrates increase, they act as a plant nutrient causing an increase in plant growth. Then as the plant material dies and decomposes, dissolved oxygen levels decrease. If high levels of E.

coli are present in the water, whole body contact (swimming, etc) should be avoided. E. coli bacteria can be an indicator of fecal contamination. If contaminated water is ingested in sufficient quantity illness can result. ***Groundwater levels*** measure the depth below the surface of available groundwater resources in observation wells which are monitored by the Missouri Department of Natural Resources (MDNR). Groundwater-level observation wells serve much the same purpose as the oil-level dipstick on an automobile engine. The groundwater levels can lower as a result of drought, over-pumping and wasting water for non-essential uses. An economic burden can result as these decreasing groundwater levels can cause homeowners to drill new wells or lower existing pumps. The observation well network helps serve as an early warning system that can identify where groundwater use is occurring at a rate that the aquifer cannot sustain indefinitely.

***Community well chemistry*** reports the nitrate levels present in water. The Springfield City Utilities’ laboratory routinely monitors community wells for several factors including nitrate. Water with nitrate levels in excess of 10.0 milligrams per liter (mg/l) is considered unsafe for drinking.

***Boil orders*** are issued by the Missouri Department of Natural Resources (MDNR) when community wells are confirmed to pose an immediate threat to public health. If a public well is found to be in violation of the acute microbiological Maximum Contamination Level (MCL) MDNR will issue a boil order. Precautionary boil order advisories may also be self-initiated by the well controlling agency for non-acute water quality issues such as low pressure or increased turbidity.

***Springfield Public Works sewer connect permits*** are required for new construction or existing buildings (which previously had private septic systems) to connect to the public sewer system for proper waste treatment.

**Community Health**

***Greene County Giardiasis cases*** are reported to and investigated by the Springfield-Greene County Health Department. Giardiasis is a protozoan infection occurring in the upper small intestine of humans. Giardia can be found in natural waterways and can infect humans if contaminated water is swallowed. Although some people do not show symptoms of the disease, they can still be contagious to others.

ENVIRONMENTAL HEALTH INDICATORS		5-Year Mean	2006	2005	2004	2003	2002	2001
WATER QUALITY	Greene County Private Well Testing (% testing safe)	60.3	64.2	62.8	60.6	58.0	56.0	58.0
	E. Coli Testing in Streams and Rivers (% testing safe)	54.3	63	68	Not Available	23	63	55
	Range of Groundwater Levels Below the Surface Springfield Observation Well (feet) McDaniel Observation Well (feet)	390-429 135-192	396-438 138-206	389-434 127-195	387-427 133-188	390-416 133-188	387-428 146-184	Not Available Not Available
COMMUNITY HEALTH	Community Well Chemistry (nitrates mg/l, average)	0.29	0.834	0.10	0.13	0.19	0.19	0.17
	Boil Orders Issued on Community Public Wells (by MDNR)	1.7	0	1	2	0	2	2
	Springfield Public Works Sewer Connect Permits	1,737	1,509	2,086	1,825	1,597	1,666	1,308
	Greene County Giardiasis Cases	20.2	22	18	22	23	16	14.6
	Elevated Blood Lead (% total tested < 6 years old)	1.6	1	1	1	2	3	2
	Food Service Inspections (% citing no critical violations)	51.2	47	43	45	55	66	39.9
	Number of Restaurants with a Smoking Exemption	87.8	91	88	91	81	Not Available	Not Available
ENVIRONMENTAL IMPROVEMENTS	Animal Bite Rate (per 100,000 population)	104.2	98.5	91.9	96.4	102.2	132.0	134.6
	Miles of Public Trail Added	3.6	2.3	5.2	2.3	7.0	1.0	Not Available
	Urban Ecosystem Analysis (net trees added)	307.7	Not Available	318	376	229	Not Available	Not Available
SOLID WASTE/ RECYCLING	Park Land Added (acres)	80.9	70.0	106.5	42.7	28.7	156.4	Not Available
	Household Hazardous Waste (tons disposed/recycled, est.)	43.6	30.8	40.0	51.3	46.6	49.5	44.6
	Percent of HHW Recycled (est.)	82.8	83	85	83	82	81	81
AIR QUALITY	Recycled Material at City Collection Sites (tons)	3,588	3,677	3,481	3,584	3,801	3,398	3,398
	E-Waste Recycled (tons)	352	527	375	304	284	270	205
	Carbon Monoxide (ppm)	<u>EPA Standard</u>						
	1-Hr Standard	35	4.2	4	4	4	5	5
	8-Hr Standard	9	2.5	2.1	2.8	2.0	3.3	4.3
	Nitrogen Dioxide (ppm)	Annual Standard	0.0112	0.010	0.012	0.012	0.011	0.012
	PM <sub>10</sub> (ug/m³)	24-Hr Standard	150	35	44	30	39	46
POPULATION GROWTH		Annual Standard	50	17	18	17	18	20
	PM <sub>2.5</sub> (ug/m³)	24-Hr Standard	65	28.2	27	29	28	31.2
		Annual Standard	15	12.0	11.5	11.8	12.2	12.2
	Sulfur Dioxide (ppm)	24-Hr Standard	0.14	0.031	0.032	0.027	0.028	0.041
		Annual Standard	0.03	0.0032	0.003	0.003	0.003	0.004
	Ozone (ppm)	8-Hr Standard	0.0722	0.071	0.071	0.070	0.073	0.076
			0.08					0.091
ENERGY USAGE	Greene County Population (est.)	265,028	278,767	273,746	263,415	258,427	250,784	246,619
	Greene County Single Family Housing Permits Issued	1,414	1,457	1,707	799	1,648	1,457	1,282
	Total Single Family Housing Units in Greene County (est.)	84,784	87,623	86,166	84,459	83,660	82,012	80,555
	Residential Energy Usage (City Utilities of Springfield)							
	Electric (kWh)	929,242,709	985,310,050	965,034,045	869,289,044	897,337,696	Not Available	Not Available
	Natural Gas (DTH)	5,680,997	5,458,279	5,426,092	5,642,846	6,196,772		

identify and address problems before they could result in food-borne illness. Critical violations include improper refrigeration and cooking temperatures, cross-contamination, bare-hand contact with ready-to-eat foods, inadequate hand washing and sanitation practices.

***Smoking exemptions*** are issued in Springfield by the Springfield-Greene County Health Department based on the Clean Indoor Air Ordinance. Exemptions may be given for the following reasons: a separate, climate controlled smoking area/room, gross annual liquor sales greater than \$200,000, greater than 50% of total gross sales being liquor, or less than 50 seats in the establishment.

***Animal bite rate*** includes the bites of both domestic and wild animals which are reported to the Springfield-Greene County Heath Department and investigated by the Animal Control Section. Diseases associated with animal bites include rabies, tetanus, tularemia, cat-scratch fever, and plague. Animal bites may also transmit pathogens such as Streptococci and Staphylococci.

**Environmental Improvements**

***Miles of trail added*** in Greene County are proposed, implemented, and maintained by Ozark Greenways, Inc. and the Springfield-Greene County Parks Department. These trails are accessible to the public and may be used for physical activities or just to enjoy the outdoors.

***Urban ecosystem analysis*** is the net number of trees which are strategically added to public areas in Springfield by coordinated efforts of the Springfield-Greene County Parks Department and Springfield Public Works Department, a Tree City USA affiliate. The majority of the planted trees are native Missouri species.

***Park land added*** is the acres of land which are incorporated into the public park system each year. This land is evaluated, acquired, developed appropriately and maintained by the Springfield-Greene County Parks Department and the Missouri Department of Conservation.

**Solid Waste Management / Recycling**

***Household Hazardous Waste (HHW)*** can be readily recognized by product labeling which contains “signal words” such as danger, poison, warning, caution, reactive, corrosive, explosive, combustible, toxic or flammable. HHW includes products such as paints, solvents, drain openers, oven cleaners, toilet cleaners, motor oil, transmission fluids, antifreeze, batteries, disinfectants, pesticides, flea collars,

Transmission from one person to another is usually accomplished by hand-to-mouth transfer. Proper and frequent hand washing or sanitation is recommended to aid in the control of this disease.

***Elevated blood lead levels*** have been found to have detrimental effects on children, especially those under the age of six years. Childhood lead poisoning occurs primarily as a result of exposure to lead paint dust which is ingested through hand-to-mouth activity and pica (eating of lead-based paint chips). Effects of lead poisoning include slowed growth, learning difficulties, hearing problems, mental retardation, hyperactivity, kidney disease, blindness, coma and even death.

Recommendations to combat and prevent this disease are to identify and control the environmental lead sources coupled with education, proper nutrition and frequent hand washing. The Springfield-Greene County Health Department tests for blood lead levels as well as environmental lead levels.

***Food service inspections*** are conducted by the Springfield-Greene County Health Department Environmental Division staff. Restaurants, taverns, schools, retail, convenience and grocery stores are all inspected at least twice a year. In 2005, 2,495 inspections were conducted in an effort to

mothballs, rat and mouse poison, weed killer, aerosol cans, pool chemicals, shoe polish, lighter fluid, smoke alarms, and furnace switches. The U.S. Environmental Protection Agency (EPA) estimates that Americans generate 1.6 million tons of household hazardous waste per year. This can result in the average home accumulating as much as 100 pounds in the basement, garage, or storage closet. The City’s Household Chemical Collection Center is available at no charge to Greene County residents for proper HHW disposal.

**Percent of HHW recycled** as estimated by the City of Springfield Public Works Department. Recycling HHW is not only safe and economical but also protects and preserves the environment. Call (417) 864-2000 to schedule an appointment at the Household Chemical Collection Center.

**Recyclable materials** is an estimate in tons of materials that are collected at collection sites in Springfield which are maintained by the Public Works Department. Collected materials include mixed paper, cardboard, plastic, aluminum, tin, glass, leaves, and grass (yardwaste). For more recycling information, call the Recycling Hotline at (417) 864-1904.

**E-Waste Recycled** is the tons of computers, computer monitors, televisions, scanners, printers, cell phones, keyboards, speakers, TV’s, VCRs, microwaves and various other e-waste items that have been collected and recycled by the Computer Recycling Center in Springfield. The Computer Recycling Center collects and de-manufactures e-waste in Springfield. For e-waste recycling information, call (417) 866-2588.

**Air Quality**

**Carbon monoxide (CO)** results from the burning of fossil fuels in motor vehicles, power plants and utility boilers. Even the burning of firewood in devices like wood burning stoves, inserts and furnaces can be a major concern for high CO levels in certain winter weather inversion conditions.

**Nitrogen dioxide (NO<sub>2</sub> )** belongs to a family of highly reactive gases called nitrogen oxides (NO<sub>x</sub>). These gases form when fuel is burned at high temperatures, and come principally from motor vehicle exhaust and stationary sources such as electric utilities and industrial boilers.

**Particulate matter (PM<sub>2.5</sub>, PM<sub>10</sub> )** consists of fine mineral, metal, smoke, soot and dust particles suspended in the air. In addition to reducing visibility, fine particulate matter can lodge in the lungs and cause serious, long-term respiratory illness and other health problems. Sources of PM<sub>2.5</sub> and PM<sub>10</sub> in our area include road dust, vehicle exhaust, mineral quarries, grading, demolition, agricultural tilling, open burning, and other combustion sources.

**Sulfur dioxide (SO<sub>2</sub> )** is formed during the burning of fossil fuels like coal, oil and natural gas. The major sources in release of sulfur compounds are power generating plants, utility boilers and chemical processing plants. SO<sub>2</sub> reacts with rainwater causing “acid rain” in the eastern United States which can damage forests and lakes, as well as man-made structures such as buildings and bridges.

**Ozone (O<sub>3</sub> )** is an air pollutant formed by chemical reactions involving nitrogen oxides, reactive hydrocarbons, and sunlight. Commonly referred to as “smog,” ozone is a powerful respiratory irritant that can cause coughing, shortness of breath, headaches, fatigue, and lung damage. Children, the elderly, those with respiratory ailments and people who exercise outdoors are especially susceptible to its effects. Ozone can also reduce crop yields and cause damage to rubber, plastics, and many common building materials.

**Population Growth**

**Greene County population** is measured every ten years by the U. S. Census Bureau. The City of Springfield Planning Department monitors local growth rates and trends then uses this data to estimate the population between the census years.

**Greene County single family housing permits** are issued by the City of Springfield Building Services Department and the Greene County Resource Management Department.

**Total single family housing units in Greene County** is determined by adding in the new homes that are built and subtracting any houses that are demolished each year. This tracking is done by the City of Springfield Building Services Department.

**Energy Usage**

**Electric usage in residential buildings** is monitored by City Utilities of Springfield through usage meters and is measured in kilowatt hours. There are many ways residential electric usage can be reduced including, installing compact fluorescent light bulbs, turning off unused lights, purchasing energy star appliances, increasing home insulation, and utilizing solar energy to boost winter heating.

**Natural gas usage in residential buildings** in Springfield is also tracked by the provider (City Utilities of Springfield) and is measured in Dekatherms (DTH). Residential natural gas usage can be reduced by installing programmable thermostats, adjusting the thermostats a few degrees, and improving water heater efficiency.

- Brought to you by the following:
- Environmental Collaborative of the Community Partnership of the Ozarks

• Springfield-Greene County Environmental Advisory Board

• Springfield-Greene County Health Department

• Springfield-Greene County Park Board

• Springfield Public Works

• Ozark Greenways, Inc.

• Watershed Committee of the Ozarks

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*Visit these informative civic and governmental Internet sites, or call for details on environmental services:*

**Water**

- Greene County services: [www.ci.springfield.mo.us/health/database/streamtesting/index.jsp](http://www.ci.springfield.mo.us/health/database/streamtesting/index.jsp) .....(417) 864-1658
- Area water programs: [watershedcommittee.org/index.php](http://watershedcommittee.org/index.php) .....(417) 866-1127
- Recreational water illness prevention: [cdc.gov/ncidod/diseases/water](http://cdc.gov/ncidod/diseases/water) .....(404) 639-3534
- Groundwater-level observation wells: [dnr.mo.gov/env/wrc/groundwater/education/gwwhymonitor.htm](http://dnr.mo.gov/env/wrc/groundwater/education/gwwhymonitor.htm) .....1-800-361-4827
- Greene County’s water quality: [cityutilities.net/resident/WaterQualityReport.pdf](http://cityutilities.net/resident/WaterQualityReport.pdf) .....(417) 831-8822
- Alerts to boil your water: [dnr.mo.gov/env/wpp/boil](http://dnr.mo.gov/env/wpp/boil) .....1-800-361-4827
- Connecting to public sewer systems: [springfieldmo.gov/egov/publicworks/engineering/sewer.html](http://springfieldmo.gov/egov/publicworks/engineering/sewer.html) .....(417) 864-1901

**Community Health**

- Public disease investigations (esp. giardia): [springfieldmo.gov/health/surveillance.html#facts](http://springfieldmo.gov/health/surveillance.html#facts) .....(417) 864-1085
- Lead poisoning - environmental and blood levels: [springfieldmo.gov/health/lead.html](http://springfieldmo.gov/health/lead.html) .....(417) 864-1409
- Food service inspection scores: [springfieldmo.gov/health/database/foodinspections/index.jsp](http://springfieldmo.gov/health/database/foodinspections/index.jsp) .....(417) 864-1424
- Smoking & the Clean Indoor Air Ordinance: [springfieldmo.gov/egov/minutes/smokeord\\_sum.html](http://springfieldmo.gov/egov/minutes/smokeord_sum.html) .....(417) 864-1623
- Animal Control activities: [springfieldmo.gov/health/animal.html](http://springfieldmo.gov/health/animal.html) .....(417) 864-1126

**Environmental Improvements**

- Greene County hiking / biking trails: [ozarkgreenways.org/trails.html](http://ozarkgreenways.org/trails.html) .....(417) 864-2015
- Tree planting programs: [springfieldmo.gov/egov/publicworks/operations/grounds/tree\\_plant.html](http://springfieldmo.gov/egov/publicworks/operations/grounds/tree_plant.html) .....(417) 864-1136
- Springfield & Greene County parks: [parkboard.org](http://parkboard.org) & [mdc.mo.gov/areas](http://mdc.mo.gov/areas) & [mostateparks.com](http://mostateparks.com) ... (417) 864-1049 & (417) 895-6880

**Solid Waste Management / Recycling**

- Household Hazardous Waste collection: [springfieldmo.gov/recycling](http://springfieldmo.gov/recycling) .....(417) 864-2000
- Recycling programs: [springfieldmo.gov/recycling](http://springfieldmo.gov/recycling) .....(417) 864-1904
- Recycling electronics: [computerrecyclingcenter.org/recycling.htm](http://computerrecyclingcenter.org/recycling.htm) .....(417) 866-2588

**Air Quality**

- City / County air quality control programs: [springfieldmo.gov/health/airQuality.html](http://springfieldmo.gov/health/airQuality.html) .....(417) 864-1662

**Population Growth**

- Planning for growth: [springfieldmo.gov/egov/planning\\_development](http://springfieldmo.gov/egov/planning_development) .....(417) 864-1031
- Building in Greene County: [greenecountymo.org/web/Building\\_Regulation](http://greenecountymo.org/web/Building_Regulation) .....(417) 868-4015
- Tracking home building / demolitions: [springfieldmo.gov/egov/bds](http://springfieldmo.gov/egov/bds) .....(417) 864-1056

**Energy Usage**

- Energy saving programs: [cityutilities.net/resident/home\\_energy.htm](http://cityutilities.net/resident/home_energy.htm) .....(417) 831-8348
- Free interactive residential energy audit: [cityutilities.net/resident/home\\_energy.htm](http://cityutilities.net/resident/home_energy.htm)